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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/645,161	08/21/2003	John A. Geen	2550/182	7607
2101 7590 03/09/2005 BROMBERG & SUNSTEIN LLP 125 SUMMER STREET BOSTON, MA 02110-1618			EXAMINER ENGLUND, TERRY LEE	
			ART UNIT	PAPER NUMBER
			2816	

DATE MAILED: 03/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/645,161	GEEN, JOHN A.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Terry L. Englund	2816	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 December 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 21-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 21-28 is/are rejected.
- 7) ☒ Claim(s) 29 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

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## **DETAILED ACTION**

### ***Response to Amendment***

The amendment submitted on Dec 9, 2004 has been reviewed and considered with the following results:

The cancellation of claims 1-20 rendered all their respective objections and/or rejections moot.

However, new rejections are described below with respect to newly added claims 21-29.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 22-23, and 25-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. It is not clear in each of claims 22-23, and 25 which capacitive circuit "the capacitive circuit" recited within those claims refers to. For example, is it each capacitive circuit, or the capacitive circuit within the corresponding stage? For similar reasons, what do "the output voltage", "the stored voltage", and "the input voltage" actually refer to within claims 25 and 26? For example, does "the output voltage" refer to the final output voltage of the plurality of successive stages, or to the output voltage of its corresponding stage?

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

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such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 21-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meng, a reference found during a recent update search. Fig. 1 of Meng shows/discloses single voltage multiplier stage 12 in Fig. 1 comprising input terminal V-IN for receiving input voltage V-IN; output terminal V-OUT for outputting output voltage V-OUT; capacitive circuit Cx having first/second terminals (e.g. right/left sides of the Cx); first switch S2 for selectively coupling the first terminal to input terminal V-IN and output terminal V-OUT; and second switch S1 for selectively coupling the second terminal to a common terminal (i.e. ground) and input terminal V-IN. The first/second switches are controlled by controller OSC to alternate between a charging state and an output state (e.g. see paragraph 0003). For example, one of ordinary skill in the art would understand that during a charging state, the first terminal is coupled to input terminal V-IN, and the second terminal is coupled to the common terminal; and during an output state the first terminal is coupled to output terminal V-OUT, and the second terminal is coupled to input terminal V-IN (e.g. see corresponding Figs. 2c and 2d). Therefore, the function of the single multiplier stage is well known. [Note: One of ordinary skill in the art would realize first/second switches S2/S1 of Fig. 1 correspond to P1,P2/N1,N2 of Figs. 2C and 2d. For example, first switch S1 comprises first switch portion P1 and second switch portion P2.] However, the reference does not clearly show or disclose a plurality of successive stages (e.g. at least two). It would have been obvious to one of ordinary skill in the art to couple two or more of Meng's stages in succession, wherein the first stage would have its input terminal connectable to a voltage source to receive an initial voltage to be boosted by the stages, wherein each subsequent stage would have its input terminal connectable to the output terminal of its

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preceding stage. The final (or last) stage would have its output terminal providing the final output voltage, thus rendering claim 21 obvious. The number of successive stages would depend on the voltage level applied to the input terminal of the first stage, and the desired final output voltage level. Capacitive circuit Cx includes single capacitor Cx, rendering obvious claim 22. It would have been obvious to one of ordinary skill in the art to use a plurality of electrical components (e.g. switches and capacitors) to form the desired capacitance within capacitive circuit Cx, and claim 23 is rendered obvious. By providing means to selectively determine what the capacitance value of capacitive circuit Cx is, allows the circuit's user to change voltage levels and/or charging times within each stage to meet requirements of the overall circuitry using the voltage multiplier. Since the common terminal is ground, claim 24 is rendered obvious. One of ordinary skill in the art would understand that a corresponding predetermined voltage would be stored in the capacitive circuit of each stage during the charging state, and the output voltage of each stage would be substantially equal to that stage's input voltage plus the stored voltage within the corresponding stage, rendering claim 25 obvious. It also would be obvious to one of ordinary skill in the art to have capacitive circuit Cx charge to substantially the full amount of the stage's input voltage, wherein in the output state, the output voltage of the stage would be substantially equal to twice the input voltage, and claim 26 is rendered obvious. As shown in Fig. 1, stage 12 comprises output reservoir capacitor Cout coupled between output terminal V-OUT of the stage and the common terminal. Thus, claim 27 is rendered obvious. An oscillator, such as OSC shown in Fig. 1, would be the controller for controlling the first/second switches of each stage to alternate between the charging and output states, rendering obvious claim 28.

No claim is allowable as presently written.

*Allowable Subject Matter*

However, claim 29 is only objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. There is presently no motivation to modify or combine any prior art reference to ensure the switching frequency of each successive stage is “approximately half the switching frequency of its immediately preceding stage” as recited within claim 28.

*Prior Art*

The other prior art reference cited on the accompanying PTO-892 is deemed relevant to the claimed invention. Fig. 1A of Rosenthal et al., another reference found during the recent update search which shows a voltage multiplier with only two switches, also clearly shows a single voltage multiplier stage 100 comprising input terminal VIN; output terminal VOUT; capacitive circuit 102 with first/second terminals +/-; first switch 105 for selectively coupling first terminal + to input terminal VIN and output terminal VOUT; second switch 104 for selectively coupling second terminal – to common terminal GND and input terminal VIN; and output reservoir capacitor 103. Although the Rosenthal et al. reference does not clearly show or disclose a plurality of successive stages, it would have been obvious to one of ordinary skill in the art to use two or more successive stages, for the reasoning applied above with respect to the prior art rejections using the Meng reference. Therefore, this reference should be reviewed and considered carefully.

The applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).



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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication, or previous communications, from the examiner should be directed to Terry L. Englund whose telephone number is (571) 272-1743. The examiner can normally be reached Monday-Friday from 7 AM to 3 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Callahan, can be reached on (571) 272-1740.

The new central official fax number is (703) 872-9306.


Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-1562.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TLE

Terry L. Englund

6 March 2005

  
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